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ANIMAL KINGDOM

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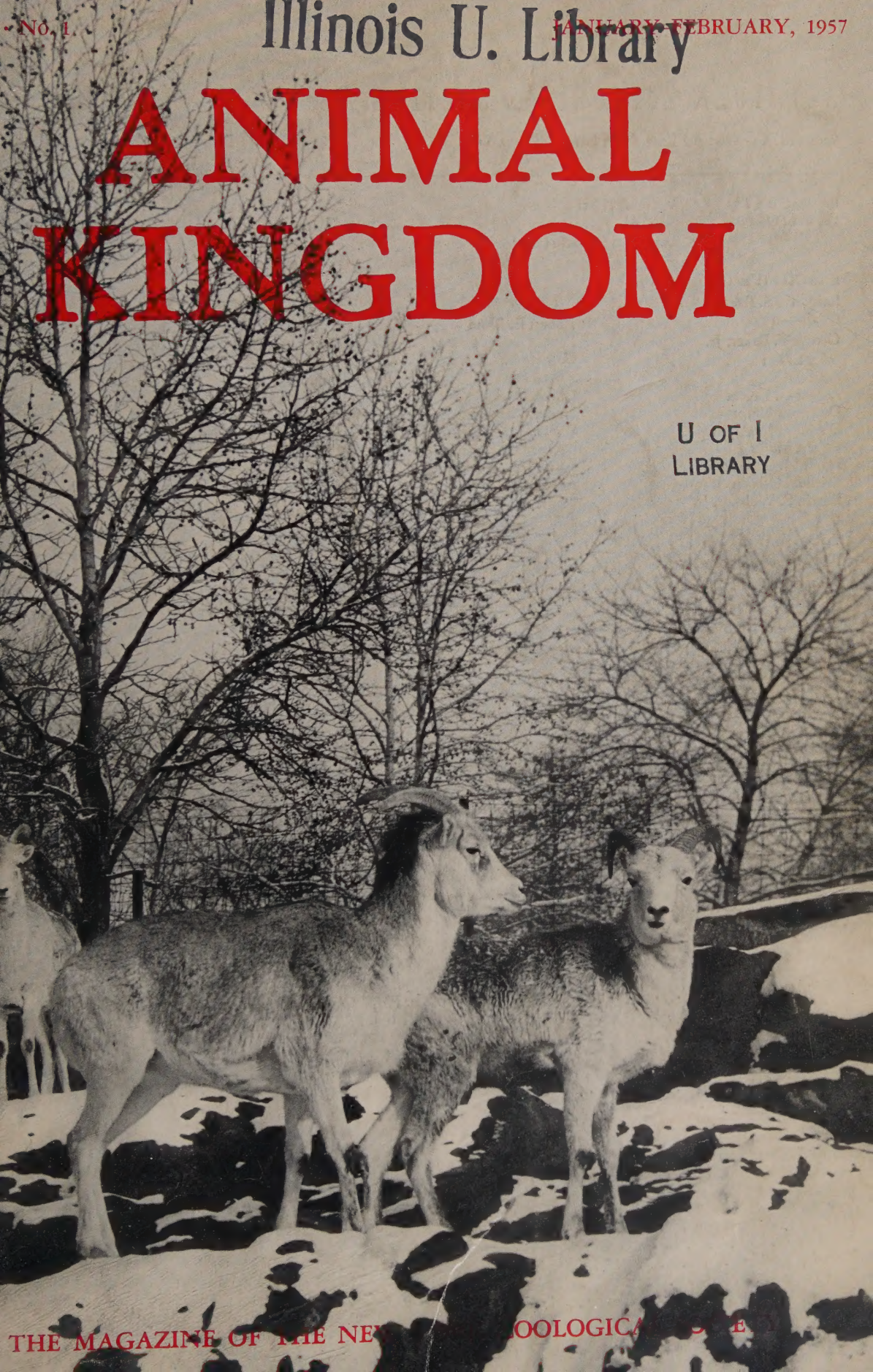

THE MAGAZINE OF THE NE OOLOGICA E

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ANIMAL KINGDOM

Bulletin of the New York Zoological Society

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The Choice Still Lies with Man

YES, I admire some of these things – that new computing machine that will do a week's work in a second, the jet plane that tomorrow will take me to the other side of the earth in a few hours, the shovel that will move a hill in a morning, and even the radar beam that we throw against the silent moon. What a man is man! I admire; or perhaps do I wonder, or perhaps do I even dare to question? We, all of us, are living in the age of power, of inventions, of machines. These are of man's creation – can we doubt that they are good? Surely the hands of humanity's clock cannot be turned back.

Out beyond the great massed centers of clustering people and of potent machines lie tranquil lands, silent forests, wild animals in their retreats, mountains towering in seeming watchfulness, rims of oceans brightened by the silent moon. To these glories come many people carried in their machines; their spirits, however, propelled by an innate love that is beyond definition. But so many more never come, nor can they, for they are the imprisoned ones, in duress to that which humanity has created.

We live in an age of many questions but none more searching than those suggested by the above reflections. Will man continue to revere nature? Will he preserve its glories? Will he nurture the productivity of the lands and oceans, the sources of his own life? Or, in the end, will he find his earth desolated, he himself a captive of the forces he has created? The fable of the genii is being retold, yet the choice still lies with man.

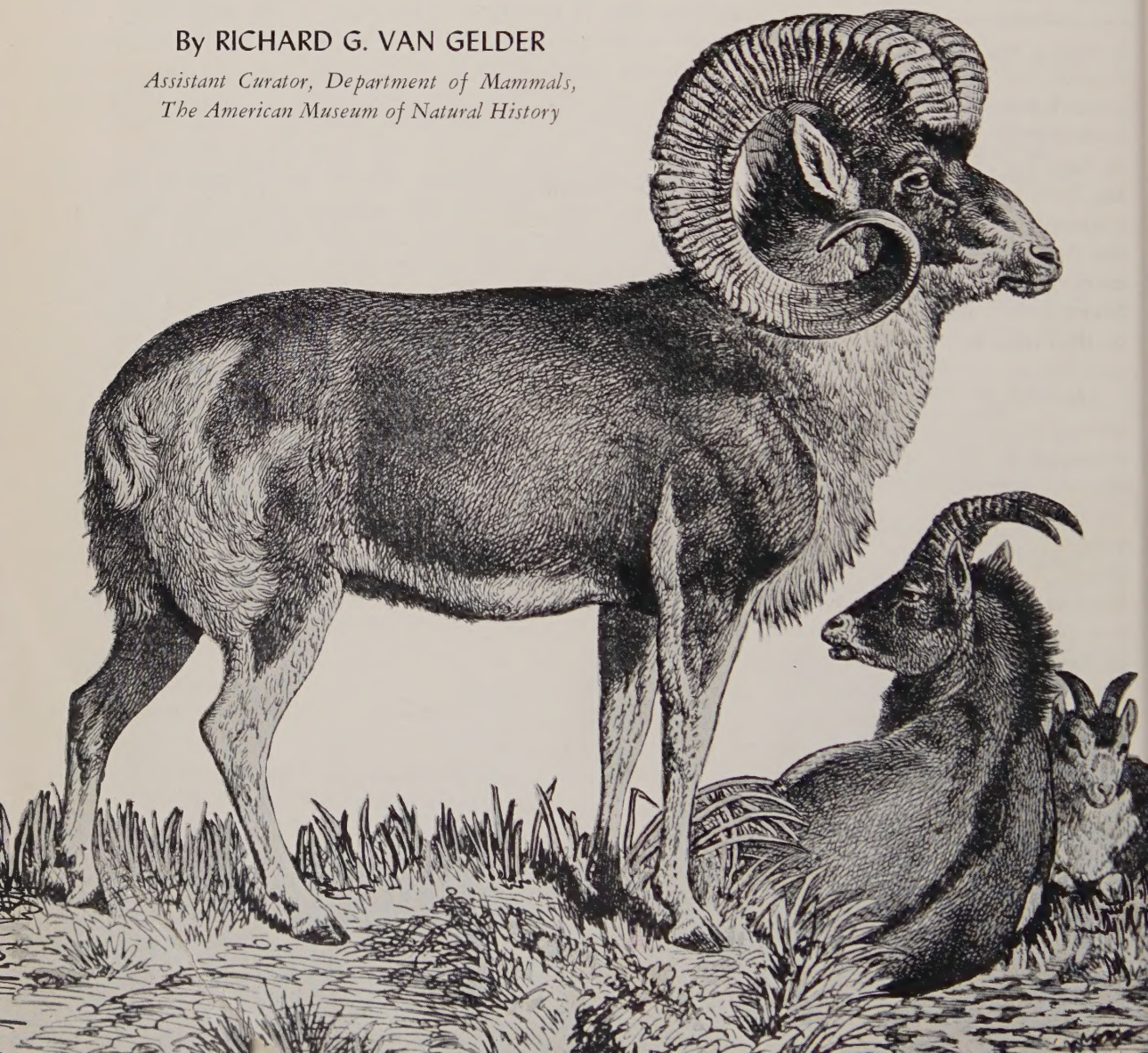
Fairfield Osborn

THE SHEEP THAT WAS A LEGEND

By RICHARD G. VAN GELDER

Assistant Curator, Department of Mammals, The American Museum of Natural History

MORE THAN 650 YEARS AGO a teen-aged boy on his way from Venice to China made notes about the people and their habits, the scenery and the animals he saw in the lands through which he passed. Some years later, in a Genoese prison, he dictated the story of his travels to produce the book we now know as "The Travels of Marco Polo." Among the animals that he first described for western eyes were a giant bird, the Roc (of "Arabian Nights" fame), which could carry off a rhinoceros; cattle almost the size of elephants and wild sheep "of a large size, having horns three, four, and even six palms in length." So large were these horns that the natives used them as ladles and vessels for holding food, constructed fences with them and even heaped them into cairns along the roads to guide



travelers when the ground was covered with snow.

For half a millenium Marco Polo's giant sheep was thought to be just another legend like the Roc or the huge cattle, or at best, a goat—probably an ibex. But in 1838 a British Naval officer, Lieutenant Wood, returning from a diplomatic mission, obtained the skulls with horns of two large sheep and sent them to the British Museum. In 1840 Mr. Blyth, a specialist on game animals, recognized the specimens as being the same (presumably) as the animal described by Marco Polo, and before the Zoological Society of London he named the sheep, saying, "I here propose to dedicate the present splendid animal to the illustrious Venetian traveler of the thirteenth century, by the name of *Ovis Polii*"—literally Polo's sheep.

Although Blyth named this sheep a full species, subsequent classification has shown that it is only a subspecies, or geographic race, of the Argali, *Ovis ammon,* and the proper scientific name for the Marco Polo Sheep is now *Ovis ammon polii.* The Argali has a wide distribution in Asia, but that section of the species known as the *"polii* group" seems to be limited to the high country between the headwaters of the Irtish and the Amu Darya Rivers. The *"polii* group" contains eight subspecies, of which the Marco Polo Sheep is the southwesternmost, being found only on the high Pamir Plateau of Russian Turkestan, near the border of Afghanistan.

Marco Polo's Sheep, or Pamir Argali as it is also called, is the most prized of all game sheep. Although it is not the largest sheep in body size, the males have the longest and widest-spread horns, and the high and hard-to-reach plateau where they live makes them much sought as trophies. The horns of male Pamir Argalis form a loose spiral which may measure more than four feet from tip to tip. An individual horn may be as long as six feet, measured along the outer curve, and may be more than sixteen inches in circumference at the base. The horns form so wide a circle that the ram cannot rest his head on the ground and can only touch the ground with his muzzle. The horns of the female are shorter, measuring about fifteen inches, and are narrow and only slightly curved. A large male will be three and a half feet high at the shoulder and may weigh three hundred pounds. The upper parts are covered with a light brown hair, darker towards the midline of the back, and the under parts, throat, chest, buttocks, outer surface of the thighs and most of the face are white. In winter the hair is longer and the males get a white ruff on the throat and a dark crest along the back; females lack the white throat and ruff.

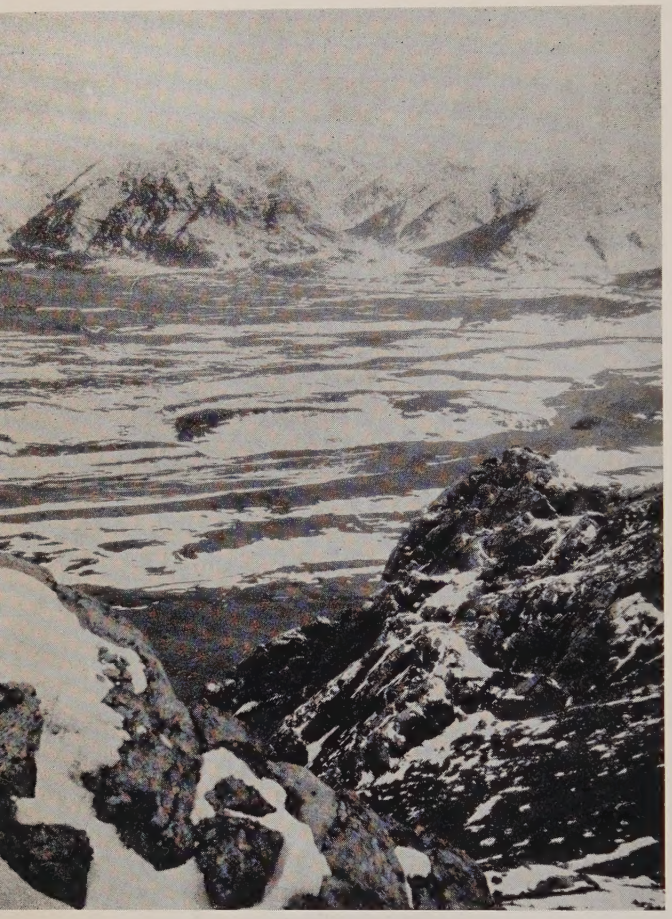
Ovis ammon polii is an animal of the high country. Rarely, if ever, do they descend below 10,000 feet, and they have been seen feeding above 18,000 feet. The Pamir Plateau is a rolling plain, and here the ewes of all ages and the young of both sexes graze in large flocks. Ordinarily the adult rams keep to themselves in parties of two to ten, occasionally more, and playfully butt or stab sidewise at one another as they move to and from the feeding grounds. At little patches of grass along the snow lines the sheep feed from early morning until an hour or two before noon. Then they lie down, choosing the drier places, and ruminate until three or four o'clock in the afternoon when they again graze until dark and then bed down for the night. They do not seem to be confident of their footing on snow, and ordinarily they try to avoid snow-filled gullies and drifts. When they must cross such an area, one animal usually leads and tests the footing, and when a safe passage is found, the rest of the flock follows.

In the rarefied atmosphere in which they spend the summer, the sheep move slowly. When pressed and running uphill, they open their mouths as if to breathe more deeply and make frequent stops. At 18,000 feet where these sheep spend the summer, there is about half the oxygen in the atmosphere that there is at sea-level and almost one-fifth less than at the Pamir Argali's winter range at 11,000 feet.

Marco Polo's Sheep breed once a year, in late autumn, and the gestation period is five months. The time of lambing seems to vary considerably in the different subspecies of *Ovis ammon,* and it is most likely that the season of birth is later in those areas which have a more severe climate.

ugh it is not the largest sheep in the world, Polo's Sheep has the largest horns. The body t has been estimated at 500 pounds for a ram; we, with straighter horns, is a little smaller.

Illustration from Lydekker's "Royal Natural History"



The home of the Marco Polo Sheep is in the Russian Pamirs, called "the roof of the world." It is a high, forbidding habitat.
Photo American Museum of Natural History

Diagonal lines show the home of the Argali; cross-hatched lines indicate the much more restricted home of the Marco Polo Sheep.

It is reported that the young ewes have but a single lamb, the older ones ordinarily two.

Life is not easy for the Marco Polo Sheep. In winter, when the snows have forced them from the high meadows to the lower slopes, they are plagued by starvation and preyed upon by wolves. In the spring when the snow melts, decaying carcasses are to be seen by the dozens. Even Marco Polo mentioned that the wolves preyed heavily on these sheep and he, too, found the piles of bones left when the snows were gone and told how the natives heaped them into cairns to mark the roads. In the summer the wolves are not such a problem to the Pamir Argali, for they can be seen at a greater distance and the sheep can escape more readily, but at this season the sheep are bothered by parasites. Fly larvae burrow beneath the skin of the adults, and may even infest the nose. Ticks attach themselves and gorge on blood, and Marco Polo Sheep have been observed rubbing against rocks, presumably to remove the annoying ticks.

Thus far man does not seem to have affected the life of the Marco Polo Sheep too greatly. The difficulty in reaching their home has limited the number of sportsmen who hunt them, and the natives hunt them mainly in the winter when there is not enough food for all the animals anyway. It has been noted, however, that rams with huge horns of 80 or more inches are no longer to be found, and this probably can be attributed to the sportsmen. Thirty years ago as many as fifteen hundred sheep could be observed in a month on the Pamir Plateau; sixty years ago as many as 600 head were seen in a single day. No information seems to be available concerning their present status, but it seems likely that as the natives obtain modern firearms, without hunting restrictions, the numbers of these magnificent sheep will be greatly reduced. In some parts of their range the animals have already moved to

ıe wilder, more inaccessible sections where they re less likely to be persecuted by man.

Perhaps the greatest decrease in numbers of Marco Polo's Sheep was caused indirectly by ıan. In the winter of 1897-1898 rinderpest cattle plague) infected the flocks in the Pamir egion and sheep died by the hundreds. In some istricts almost every animal may have succumbed. The disease was undoubtedly contracted rom the domestic stock of the natives.

When they first notice the presence of a man, sually seen at 200 to 300 yards, the sheep all ace him and crowd together, stamping the round with the forefeet and sometimes even approaching him. Suddenly one will turn and run, nd in a flash the entire flock follows. But after unning a few hundred yards they will often turn nd stop for another look, and then turn and run gain and stop. When galloping the males carry the head erect, rather than outstretched, probably because of the great weight of the horns.

Because of the inaccessibility of their home, it has been difficult to obtain specimens for American zoos. It was not until a year ago that the first live Marco Polo Sheep were received in this country, but last fall, after a month's quarantine, three young sheep, two females and a male, came to the Bronx Zoo. Their new home is in a spacious and rocky enclosure north of the Antelope House, where it is hoped that in a few years the male will develop the magnificent horns that made such an impression on Marco Polo (and everyone else who has seen them) 650 years ago.

Typically, the young male of our trio of Marco Polo Sheep is down at the right, almost out of the picture. The two females, being older and larger, usually drive him to the background.

The Amphibious Dipper

By WILLIAM G. CONWAY

A GRAYISH BLUR, a shrill zeet!, a splash. A few moments later a chunky, slate-colored bird broke the surface of a swiftly-tumbling stream in a Rocky Mountain canyon and stood on a rock to preen, with occasional bobbing dips like haphazard punctuation. This was my introduction to the dipper, or Water Ouzel, in its remote mountain home, a stream some ten to thirty feet wide that varied from a rushing boulder-strewn torrent to a gentle and meandering brook, and from white-water cascades to transparent and marble-surfaced side pools.

With a view toward gaining information which might some day be used in designing a display of Water Ouzels in the Zoological Park, I had inquired about the best dipper haunts in the Pike's Peak region of central Colorado. Eleven Mile Canyon, thirty-five miles west of Pike's Peak at an elevation of some 8,000 feet, was suggested as the most likely hunting grounds for a day's ouzel quest in September. And it was, indeed, a good one.

Even as I watched, the dipper casually tightened his feathers and walked into and *under* the water. A dipper's plumage is unusually thick and dense and its nostrils can be covered by a movable scale. I knew this — but, still, the sight of a small bird calmly striding under water is enough to startle anyone the first time he sees it. It is no less surprising when the bird bobs to the

rface and turns about like a waterlogged phal-
ope, obviously almost dry despite a walk under
ater—and then to see it squat in a shallow pool
d go about the business of bathing like any
dinary dry land avian! Seeing this, it is still
me minutes before you remember that the oil
and, so very important in water-resistant feather
essing in waterfowl, is much larger in dippers
an in related land birds of comparable size.

Five species of dipper are recognized, two in
urope and Asia, one in North America and two
South America. Believed to be of American
igin, they are one of those New World families
hich may at one time have crossed the so-called
ering Strait land bridge to the Old World, along

dipper is tied to a certain environment more strictly than any captain to his ship. Probably the greatest hazard future dipper populations will have to face is increasing stream pollution from mills and mines. "Free as a bird" is an expression which rarely bears close scrutiny in regard to animals, and the dipper is no exception. Its food-seeking and reproductive behavior are tied to its habitat, and as the mountain streams go, so goes the dipper.

Even the flight of the dipper is adapted to its tortuously twisting mountain streams. As John Muir puts it, in his lovely ouzel chronicle: "The vertical curves and angles of the most precipitous torrents he traces with the same rigid fidelity,

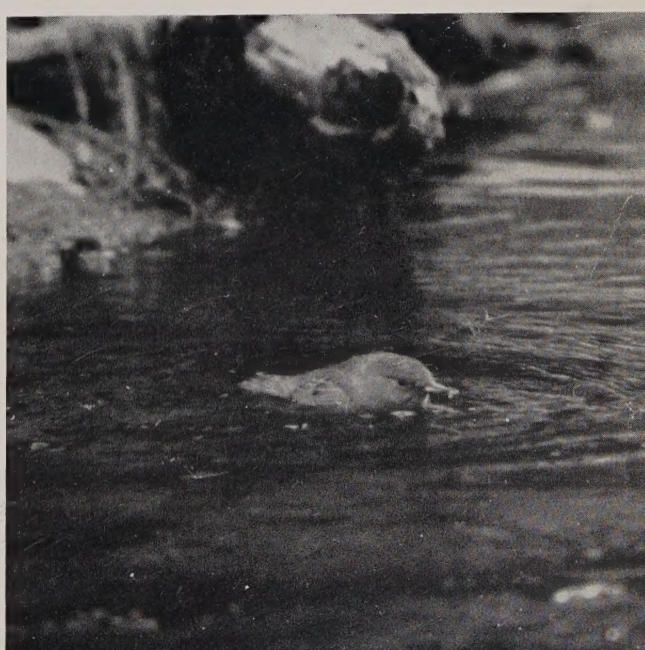
Looking not at all like the kind of bird that ought to go in the water except to take a bath, the Water Ouzel nevertheless is completely at home in swiftly flowing streams and in quiet pools. In the center photograph, it is tails-up, just beginning a dive.

Photographs by the Author

th other groups such as wrens and buntings.
uzels seem to be more closely related to wrens
an anything else.

The dipper I was watching in that mountain
eam is known as *Cinclus mexicanus unicolor.*
though it is not migratory, it may move down-
eam a little way toward less severe weather in
nter, but it is capable of withstanding great cold
d stays in its "summer home" as long as there
open water. Its over-all range is large, along
e mountains of western North America from
rthern Alaska and western Canada south to
uthern Mexico.

Its ecologic niche is a rigorous one, and the



swooping down the inclines of the cascades, dropping sheer over dizzy falls amid the spray . . ." That is exactly how my ouzel flew, and my enthusiasm for finding a way to exhibit the bird in a zoological collection grew stronger as I watched — for it is reasonably easy to envision a Bird House complete with a Rocky Mountain stream and even an aquarium-like under-water view.

Peering through the surface reflections of the dipper's hunting grounds, I could see the stubby form, now sleek and streamlined under water, searching intently around the pebbles and debris of a clear pool. From time to time, bobbing to the surface like a bubble in a champagne glass, the dipper would paddle to a near shore or rock holding a caddis fly larva in its bill, place the insect on the ground and peck it to edible pieces. Whether the dipper swallows any of its gleanings under water is a disputed point, but anyone who has ever attempted to extract a caddis fly larva from its little fortress must have admiration for the way a dipper accomplishes this with ease under water.

The bird's ability to stay submerged seems to vary with its observer. Unlikely times, up to three minutes, have been implied. But in more than fifty measurements on a dozen birds, the longest submersion I was able to record was 21 seconds. It is not unreasonable to guess that a dipper might double this time if it really had a good reason for doing so.

Ouzels have occasionally been condemned by fishermen for eating fish fry and spawn. While these probably form a good part of their regimen at certain times in a few places, the scattered and territory-minded dipper population would certainly not commit any considerable depredations under natural conditions. Aquatic insects and larvae seem to make up most of its bill of fare.

Under swift water the dipper always appears to face into the current, orienting its body with tail high and head down while searching for food. This arrangement, with the inclined back acting as a foil, enables the bird to utilize the water current and pressure to maintain its grip on the stream bottom and avoid being swept backwards with the flow. I saw no dippers walk *downstream* under water and it is hard to imagine how they could maintain their preferred "bottoms up" position if they did so. Some observers report that dippers swim primarily with their powerful wings, literally flying under water. Others have asserted that the feet are the primary propulsive members. Limited time and unlimited water-reflections left the matter in doubt in my mind, but I find it hard to believe that the dipper can travel such amazing underwater distances, with such remarkable speed, using only its slender and webless feet.

Although my visit was favored by only a poor sampling of refined "sneezes" and shrill call notes, the American dipper's song is famous for its sparkling radiance. Muir's marvellous prose cannot be improved upon: "The more striking strains are perfect arabesques of melody, composed of a few full round mellow notes, embroidered with delicate trills which fade and melt in long slender cadences. In a general way his music is that of the streams refined and spiritualized. The deep booming notes of the falls are in it, the trills of rapids, the gurgling of margin eddies, the low whispering of level reaches, and the sweet tinkle of separate drops oozing from the ends of mosses and falling into tranquil pools."

The nest of the dipper is as unusual as its behavior. Round and about a foot in diameter, with a side entrance, almost the whole structure is built of mosses. Usually it is placed on a ledge or in a crevice of a cliff bordering the dipper's stream, and it blends beautifully with the natural moss-and-fern blanket of the rocks. The spray from falls and cascades keeps it fresh and green. In recent years, supports under bridges have often been reported as ouzel nesting sites. Usually four or five eggs form a clutch, and two broods may be reared during the season in the southerly part of the bird's range.

The Zoological Society has exhibited only one dipper, a specimen received from Charles Cordier in the spring of 1952. This White-backed Dipper, *Cinclus leucocephalus leuconotus* Sclater, was the form that ranges from Ecuador to Venezuela and is more strikingly-patterned than our native one. It adorned our collection for several months, and since its death no more have been offered. But some day they will be offered, or we will send our own expedition into their mountain fastnesses, for birds with such strange habits and specializations — difficult though these make them — are real avicultural challenges.

GRUNT, MY WILD BOAR

By MARGARET ALTMANN

Moose & Elk Researcher, Jackson Hole Biological Research Station

IN MY TEENS I had hunted the wild boar on moonlit nights from blinds in the potato fields or snow-covered woods of the Baltic ovinces of Germany. Then after a long inter-l, I returned to Europe to examine the social e of this aggressive game.

When I reached the big beech-and-oak forests the old Lippe Dukedom in Western Germany, was told that an increase of damage to field ops by wild boar hordes was noticeable in the t few years. No one knew why this was the se. Was it an influx of wild boars from the ne-too-distant iron curtain border?

The "black game," as it is called in Germany, s closely knit family ties. A band consists usu-y of a litter and its mother. Sometimes there still a few members of the previous litter in the group. The wild hogs, although excitable and aggressive among their own group, definitely help each other out and defend the young against any intruder.

The striped little wild boar pigs react to the danger grunt of the sow by scattering and lying low, a remarkable disappearance act. If the intruder happens to step on one of the hidden pigs, a tremendous squeal will bring the infuriated sow to instant action. Like a torpedo, she will aim and rarely miss a target. Fear or caution she does not know in such moments.

When peace and quiet lie over the forest thickets, the wild boar clan often gathers in an opening and the pigs play games around the foraging mother. Most games are fighting games in the wild boar manner. Squealing and posturing like

ild swine feeding in a German rest. The alert boar is looking ward the camera, in the center.

Photo: Samhaber, Aschaffenburg

This is Hans, a young wild boar encountered on a forest path.

Photo: Konrad Kurr

big old boars, heads held high, the striped little fellows hit each other with the baby tusks or pretend to do so. Running and rushing is also a favorite part of this game.

Resting and sleeping is done in closest contact with each other. The family group forms a pile and even the boar may be in friendly association with the small pigs. Many of the daylight hours are spent in the thick underbrush. At dawn and dusk, as well as at night, the clan forages in the fields. Root crops, potatoes in particular, are the favorite foods. One wild sow and her family can do considerable damage in a few hours, digging the potatoes efficiently by following the planted row.

The senses of hearing and smelling are very keen in the wild boar, while sight does not play such a role because of the thick underbrush and cover in which the animals spend most of their lives.

The daily range of the bands is considerable. They may travel four to seven miles for feeding or upon even a minor disturbance, and may leave a whole area for good when hunting pressure begins.

It is no wonder that the wild boar is considered among the wildest of game animals. Nevertheless, there are exceptional individuals even in wild boars. This is the case history of Grunzo, a wild sow, as I witnessed it while staying at the forestry station in West Germany with my ranger (forester) friends.

Grunzo had been picked up by a truck driver at night on a roadside in the deep forest of the Lippe-Westfalian districts. The forester's kind family raised the striped little squealer – first, bottle fed, later released back of the ranger station. They named the little wild pig "Grunzo" and gladly gave her a handout of boiled potatoes and grain when she visited the yard.

Grunzo soon lived entirely in the forest, but kept some privileges in the ranger station. She had learned, for instance, to open doors and, to the distress of the neat grandmother in the ranger's family, she intruded in the milk house to raid the milk and creampots, upsetting all pots and leaving a considerable mess. Months went by. One day, early in December, Grunzo stood in the yard of the ranger station while the rangers piled a load of fresh straw and hay into the hayshed.

A few days later, Grunzo had moved into the hayshed to bear her first litter. Unfortunately, one of the little pigs fell through the slats of the crude shed into the dog kennel, and was killed by the dogs despite Grunzo's brave efforts to rescue it. She bit the slats till her gums were bleeding, but to no avail. That same evening, in a bad snowstorm, Grunzo gathered her tiny litter and left the ranger station for the wintry forest. No one expected any of the pigs to survive the fury of the cold and snow. But, three days later, Grunzo brought them back, moved into the shed, and went on to successfully rear the rest of the litter.

One day in spring, Grunzo opened the door of a shed at the station and found a bag of grain on one of the shelves. It was poisoned grain for rodent control, and she died within two hours. But her wild pigs were saved and are still around the station, running free. When I was there last winter, they would follow me into the forest in the evening, and if I scratched the bristly back of one of them, the others would get jealous and start a rush to be scratched, too.

It Makes a Career of Eating Mosquitoes

By DONN E. ROSEN

Genetics Laboratory, New York Aquarium

ambusia is not the only answer to the world's osquito problem, but in the right time and lace it is a valuable adjunct of mechanical nd chemical control measures. This is a pair.

IT CANNOT BE TAKEN FOR GRANTED that where there are catfish, there are also cats. Neither do dogfish imply the presence of dogs. But osquitofish and mosquitoes *do* go together, or ave been brought together purposely, in more an a dozen states of the United States and in ore than three-score countries, islands and de-endencies all over the world. As a devourer of osquito larvae, and therefore as an agent in the ntrol of malaria, the mosquitofish has few if y equals.

The fish I mean when I speak of "mosquito-h" is any one of the two dozen or more species d subspecies of *Gambusia* – particularly *Gam-usia affinis,* the common Gambusia of the south-stern United States. Actually a number of uite unrelated fish are popularly known as mos-uitofish – the guppy, heterandria, the sunfish, e goldfish, the sailfin mollie, and many other miliar freshwater minnows. They are all good mosquito-eaters, but none can touch Gambusia in that department. Under certain conditions it almost, you might say, makes a career of devouring mosquito larvae.

Gambusia is not, however, the sole and self-sufficient answer to the world's mosquito problem. There are some situations that even Gambusia cannot cure and scarcely can alleviate. I ran into one of them some time ago in the Bahamas, when we were working out of the Lerner Marine Laboratory of the American Museum of Natural History on North Bimini.

Much of the shoreline of the three major islands – North, South and East Bimini – has been built up gradually with the aid of two very hardy plants that can live and flourish in salt water, the red and black mangroves. By sending out twisting and branching networks of roots into the water, they establish tangles and tunnels that almost defy imagination. On the northwest corner of South Bimini, mangrove thickets have spread to enclose a rather broad and open salt water pond connected to the main lagoon by a narrow channel, which at low tide is choked by emerging vegetation and is all but impassable. Other narrow lanes in the mangrove tangle extend a few

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hundred feet into the adjacent swamps and here, again, at low tide the black, slimy, fetid complex of roots is exposed. The pond swarms with Gambusias, which I was trying to collect for various purposes, and the job was made no easier by the fish's habit of taking refuge among the mangrove roots when frightened.

There were, as I said, plenty of mosquitofish in the pond. In two seine hauls we lifted out more than five hundred. Cautious, careful maneuvering of the seine and the beaters made it possible to round up a thousand fish in a very few minutes. Unfortunately, just before we finished the day's stint, the wind shifted and what I can only describe as a cloud of mosquitoes drifted toward us. One of the beaters was bent over, intent on the approaching school of fish, when the swarm hit him – right where his thin cotton pants were stretched tightest. He yelped and jerked upright, but the rest of us had no time to laugh at his discomfort, for in another moment we were enveloped, too.

Here, then, was a place in which the fish that feeds on mosquitoes was (to say the least) doing a very poor job of keeping down the mosquito population. Why?

It is a good question. Many years ago one of our most famous ichthyologists, Samuel F. Hildebrand, noticed that many common aquatic and semi-aquatic plants provide conditions favorable for the propagation of mosquitoes. Many of them, moreover, are so dense and extend so far into the water that they are an effective barrier against most fishes. The mangrove forms such a barrier, beyond the first few feet of roots where the Gambusias take sanctuary from predators. That is at least part of the explanation of the failure of the mosquitofish to keep down the plague of mosquitoes in Bimini.

The Gambusia we collected in Bimini has not yet been named, but it does very closely resemble two species named from other Bahaman islands, *Gambusia hubbsi* and *Gambusia manni*. All have steel-blue sides overlying a dark olive ground color, sometimes flecked with tiny black dots. Their dorsal fins are brilliant orange in nature, but this color fades to bright yellow if the fish are transferred from salt to fresh water. As is usual with most but not all live-bearers, the females are rather drab by comparison with the males, but they do retain some of the iridescent blue on the flanks and a trace of orange on the dorsal fins.

The Gambusias are not spectacular enough, I fear, ever to become popular with home aquaria enthusiasts. But the interest they have for professional ichthyologists more than makes up for that.

The reason lies in their hardiness and adaptability. The Bimini Gambusias, for instance, swim in sea water that may rise to a temperature of 95° Fahrenheit. They live alongside young barracuda and other predatory fishes and birds, and they successfully withstand daily tidal currents and seasonal hurricanes. And yet Gambusias remain among the most prolific, voracious and abundant fishes in the islands where they are found. Chiefly because of their hardiness, these fishes have recently been selected as an experimental animal in the study of human viruses. They are also interesting to ecologists (the biologists who study the complicated interactions of animals, plants, and the physical environment) because of their wide range of tolerances for constantly shifting conditions. The Bimini Gam-

On South Bimini, mangrove thickets have sprea enclose a salt water pond which is swarming Gambusias — and mosquitoes. The mangrove r are too thick for fish to reach the mosquito lar

busia is but one member of this genus that can flourish under really extreme conditions. The common Gambusia of the southeastern United States, *Gambusia affinis*, the original and still most widely employed "mosquitofish," and perhaps the one most familiar to aquarists the world over, ranges from the Gulf coastal states northward and eastward, extending its natural territory as far north as southern New Jersey and Illinois. Within this natural range the American Mosquitofish (known also as top-minnow or pussy-gut) may be found in an almost endless profusion of different and sometimes quite extreme habitats. Picking its way through the torrid swamps of our southern coastal states, or wintering under a layer of ice up north, invading the coastal salt and brackish waters of our estuaries and bays, or running into fresh-water inland streams, inhabiting crystal clear fresh-water lakes and ponds as well

the foul stagnant water of bogs and swamps, ainage ditches and rain barrels, it flourishes ıder such extremes. One writer has even re-ɔrted Gambusias living in the extremely foul ıter of drying borrow pits in Louisiana – holes cavated for the purpose of obtaining fill, which ıve gradually accumulated water from ground epage and rain.

It is this surprising toughness, particularly of e American *Gambusia affinis*, coupled with an ormous appetite for almost everything of the ght size that wiggles, jumps or swims, that has ade these little fishes so famous in mosquito atement programs. On May 26, 1919, 40 fe-ale and 12 male *G. affinis* were introduced into ı ornamental pond on the campus of the Uni-ersity of Pennsylvania in which mosquitoes mmonly bred during the spring and summer. art of this pond had been carefully screened off, us allowing some of the mosquitoes to reproduce nmolested during the course of the experiment. y June 5 the mosquitofish not only had eagerly nsumed a large portion of the larval mosquito pulation but most of the initially more abund-nt midge larvae and other aquatic organisms as well. Sampling of the exposed places of the pond at this time showed an average of 2 to 3 mosquito larvae per sample in the pond proper as compared with about 16 in the screened-off area into which the Gambusias could not penetrate. On June 18 Gambusias could be seen all over the pond and a sample at this time brought forth only 4 mosquito larvae in 30 dips of the sampling device, compared with about 5 larvae per dipper in the check pen, some 20% of which were the malarial mosquito, *Anopheles*. On June 30 conditions in the unscreened portion of the pond were the same, while in the check pen the count had risen to an average of about 14 larvae per sampling. It was estimated at the end of three months that the total fish population derived from the 52 Gambusias introduced on May 26 was in the neighborhood of several thousand. In a more recent experiment conducted at the Michigan State Fish Hatchery, the mosquitofish was found to be roughly 81 and 95 per cent effective for two consecutive years in the control of mosquitoes. Once, in connection with a similar study, someone watched a 2⅓ inch female top-minnow consume 225 wiggle-tails in one hour. While this

figure is hardly typical of the majority of mosquitofish, especially the much smaller males and young fishes, it serves to emphasize their potentialities as mosquito-killers.

So successful have these live-bearers proved to be in our own anti-malaria campaigns that in the course of something more than 30 years they have been transplanted to almost every habitable part of the globe with good success.

Amusing circumstances sometimes arise as a result of foreign introductions of mosquitofish on a world-wide scale. Recently one of our museums received a shipment of fishes from the Nile, and unpacked it in anticipation of a collection which might contain some of the more rare and interesting fishes of that region. Inevitably a large proportion of the fishes were the common mosquitofish that occurs naturally only a short distance away in the museum's own state. Equally disappointing was my own experience in getting a small cardboard container of "unusual" fish from the Belgian Congo. As pretty as they are, I sometimes think I could almost hate those pesky *Gambusia affinis*.

In 1952, Mr. E. Thomas Gilliard of the Department of Birds at the American Museum of Natural History went to the mountains and jungles of eastern New Guinea in search of birds of paradise. He returned to New York with a great assortment of animals, many new to science, which was not especially surprising in itself because the area had been virtually unexplored, except for some military operations during the second World War. I had examined some of the fishes collected at about 5,200 feet above sea level 30 miles from the headwaters of the Wahgi River, and identified some of them as our old friend, *G. affinis*. I was further able to pin them down as having derived from one of our native eastern strains, similar in many details to the mosquitofish of Florida's Okefenokee Swamp. Some days later I told Mr. Gilliard of my identification and he appeared both surprised and a little indignant. Then he remarked in his usual good humor that it was bad enough to have collected a fish in the wilds of New Guinea that proved to be a native American, but that it should be one of our more common species and, what's more, from a stock somewhere east of the Mississippi, was adding insult to injury.

After all this ado about the larvicidal properties of the Gambusias, we may refine our explanation of why Gambusias and mosquitoes in some places seemingly live side by side so harmoniously. All told, there are more than two dozen named forms of the genus *Gambusia* native to the United States, Mexico, Central America, the northern tip of South America, the Bahamas, Cuba and many other Caribbean islands. Mosquitoes are a major problem in all of these areas, and we can be reasonably certain that all of the two dozen Gambusias are just as "mosquito crazy" as their northern cousin *Gambusia affinis*, for all of the members of this genus are highly carnivorous. The point of the Bimini anecdote above is that although these little top-minnows abound in all of the Bimini islands and in most of the lesser keys, the special environmental conditions which exist there are such that *the Gambusias cannot easily get to the mosquitoes' breeding grounds or the aquatic juvenile stages in the mosquitoes' life cycle*. This is a very important point and one that is crucial to all the years of research that have gone into adapting these fish as self-perpetuating insecticides.

A slightly different approach has helped to clarify still another of the many problems in our never-ending fight against diseases transmitted by insects with an aquatic juvenile stage somewhere in their life histories. The type of food consumed by a fish such as Gambusia, with larvicidal capabilities, is determined to a very large extent by the *availability and relative abundance of the different foods*. Where some insect larvae other than mosquito, or crustaceans such as Daphnia, are more common than wiggle-tails, the Gambusias actually "steer clear" and allow the wiggle-tails to become malaria-carrying adults — just as those in the University of Pennsylvania experiment first consumed the other more abundant organisms before they ate the wigglers.

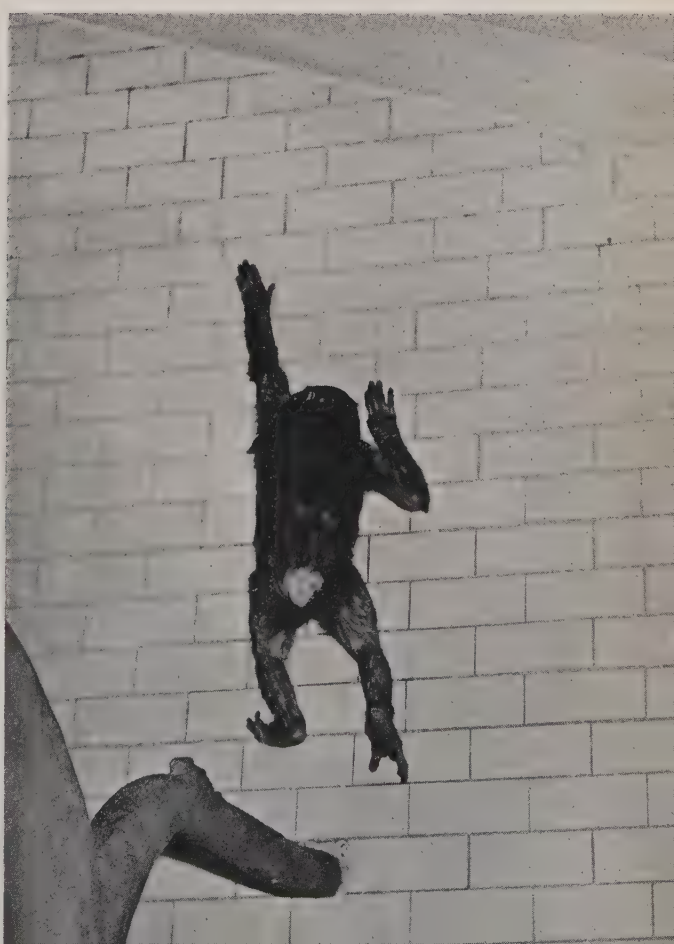
Limitations such as this do not really impair Gambusia's usefulness, for where the fish alone fails to produce good control, health inspectors all over the world have learned to supplement it with mechanical and chemical control measures. But there are many situations in which the fish alone is adequate to the job and the continuing introduction of the mosquito-fish into more than 70 foreign lands bespeaks its astonishing success.

ZOO NEWS IN PICTURES

Photographs by
SAM DUNTON

/hen will he drop his antlers? With e exception of one year, we have a mplete record of shedding dates for is magnificent **AMERICAN ELK** that me to the Zoo from the Jackson Hole ildlife Park in February, 1947. In at year it shed on April 18, but subquently there has been a fairly regu- progression toward an earlier date: arch 31, 26, 28, 20, 19, —, 18, 19, . It is possible that elk shed earlier as ey grow older; this is said to be the se with Moose. One of our Moose in period of 5 years moved back its edding from February to November.

Until this past mid-December, the last time we had exhibited the **LONG-NOSED TENREC** of Madagascar was in the spring of 1914. When a male Tenrec was presented to us on December 17 by James Dolan, a Member of the Zoological Society, we had few hopes of keeping it more than a few hours, for it was obviously half dead, with hardly the energy to stand on its legs. Drs. Goss and Gandal fed it hypodermically with glucose and protein and injected massive doses of multiple vitamins, and then turned it over to Hospital Attendant Waltz with instructions to do his best. As with any good keeper, his best was very good. Tenrecs are said to feed on earthworms, so he scraped under leaves in the frozen forest and collected earthworms, which he buried in a pan of loose dirt to tempt the little animal. He cajoled it into taking a mixture of milk, egg yolk and finely ground meat. Within a week the limp and listless Tenrec was transformed – so lively that these photographs had to be made with a fast electronic flash.



will a **CHIMPANZEE** do for a piece of pine-? These three pictures are part of the answer, for show our "Little Women" — Amy, Jo, Beth and — in the quite improbable areas of their compart- in the Great Apes House that they have managed ch in their quest for their favorite delicacy hidden by their keeper. Scaling the slick tile wall at the r, where it forms a 90-degree angle, is no trick at ney have been doing that for a couple of years. tly they have learned to walk across the wall by ng against a ceiling beam with their hands; one ven had a certain amount of success in jumping limbing the bare wall, but never reaches the top.

A Week on Lobo

By MARGARET E. MURIE

Pen & Ink Illustrations by
OLAUS J. MURIE

and always-the ptarmigan

THE TERRITORY OF ALASKA contains the last large expanses of untouched wild country in United States possession. With the increase of population everywhere, development of earth-moving and road-building machinery and the growth of military establishments, conservationists have had misgivings about the future of even a small segment of this Alaskan wilderness. The New York Zoological Society and The Conservation Foundation sent Dr. A. Starker Leopold and Dr. F. Fraser Darling to Alaska in 1952 to make observations on the status of wildlife. In May of last year the Society and the Foundation sponsored another expedition, to the Brooks Range, under the leadership of Dr. Olaus J. Murie. Its purpose was to gain intimate knowledge of one area – the Sheenjek country – as a "sample adventure" in wilderness experience, "to help us decide," as Dr. Murie expressed it, "whether or not the Arctic wilderness is worth fighting for." The article that follows is Mrs. Murie's report on the "sample adventure."

ACROSS ALMOST THE WHOLE TOP of Alaska, back from the flat Arctic coastline some hundred miles, lifts the Brooks Range – a composite of many mountain groupings but forming a continuous great mountain world one hundred miles deep and up to ten thousand feet high – a massive northern rampart to all of interior Alaska.

Up into the least-known part of this mountain world we were flying in a Cessna 180, which we later learned to know as the "small but mighty" bird of the Arctic. Under the generous sponsorship of the New York Zoological Society and The Conservation Foundation, we were going to spend the summer as far north and as far into the mountains as we could get, in the valley of the Sheenjek River, to try to find what this Alaskan Arctic has to offer of wilderness peace and recreation and possibilities for scientific research.

On this half-overcast, mild first of June, Olaus and I and Dr. Brina Kessel, a young professor of zoology at the University of Alaska, had flown

regular air service from Fairbanks to Fort ukon, and there with no delay had been "in- rted" with our baggage into the Cessna wheel ane.

The exploratory flights had been made the eek before. Keith Harrington, bush pilot for Vien Alaska Airlines, stationed at Fort Yukon, ıd flown the two young men of the party, Bob rear and George Schaller, up the Sheenjek the ıy before and landed them, with wheels, on the e of a lake. So far as anyone seemed to know, is was the first such landing on ice in the heenjek valley. And Keith had made two more ips with all the supplies.

Now we were flying over the flat tundra north Fort Yukon. The land gradually rose; we ossed a range of low hills, the Beaver Moun- ins. Then we saw our river, the Sheenjek, east our course, winding its slow, looping way to in the broad Porcupine River.

We flew for an hour and a half, and fingers of mountains were coming toward us. The white peaks far north in the pale blue sky began taking on outlines. Finally we were passing between shoulders of low mountains, the gateway, and the Sheenjek was below us again. All around, in the wide valley of its meanderings, were lakes, some reflecting the sky, some still solid white. Over the largest of the frozen ones our little plane banked, circled, and Keith shouted in my ear: "On the little bench above the lake—see the tents?"

Yes, and we saw the boys running, too, running out onto the ice as the plane touched down gently as a hawk and rolled crunchingly through slush ice to a stop.

George's first words were: "Brina! Two ptarmigan nests with seven eggs, already!"

And that exclamation set the tone of our first weeks at Lobo.

But mammals were not far behind birds in excitement. In the midst of the flurry of unpacking and trying to find food and prepare a meal, George was scanning the far shore for caribou. "Grizzlies!" he shouted, and he and Brina both

he expedition camped in tents on the shores f Lobo Lake, deep in the valley of the Sheen- k River in the Brooks Range of Alaska. This wilderness at its best, and still unspoiled.

Photograph by George Schaller

scrambled to find the telescope in the pile of equipment. Across the lake, across the river, up the far slope in a yellow grassy swale – there they played, two of them, chasing each other. When I took my turn at the telescope one of them was standing on its hind legs. They were very pale in color, paler than the dry winter grass they rolled and played on. Here was a first-night welcome, indeed!

In this age it is becoming a more and more rare experience to live in an environment wholly nature's own, where the only sounds are those of a natural world. Here at Lobo all sounds were charming, and I use the word in its original, strongest, sense – *charming*. Nearly always a little breeze was whispering through the small and scattered white spruce on the mossy hillside; there was the splash of a muskrat diving off the edge of the ice; ptarmigan crowing, clucking, talking and calling all around us; tree sparrows and white-crowned sparrows singing continually. Their voices became almost a background to all the other sounds. There was the scolding chatter of Brewer's blackbirds and what at first seemed very strange up there in the far north, our close friend of all the mild, domesticated places, the robin.

These were the voices of the hillside around the camp. Out on the lake, as the ice receded from the shores more each day (and the days were warm and never-darkening), we listened to other sounds, equally charming and exciting. Predominant in the lake chorus was the "Ah-hah-

wi, ah, hah-hah-wi" of the Old Squaw duck, and there was the churring sound of the white-winged scoters, the cheerful little three notes of the baldpate and gulls making a fuss, too, at times. Lobo was about a mile long and half a mile wide, divided into two wings by a neck of tundra. Far across from us we sometimes heard the indescribably haunting call of Pacific loons, and then all the binoculars would be snatched up for a glimpse of these beautiful patricians of the north.

From my journal, June 3: "As I sit here on this soft mossy slope above camp writing, the writing has been very erratic because of those who live here. I have watched a band of fifty caribou

feeding back and forth on a flat a quarter of a mile away; ptarmigan soaring and cluck-clucking and giving their ratchety call, all about; tree sparrows so close and unafraid; cliff swallows hurrying by; Wilson snipe and yellow-legs calling; gray-cheeked thrushes calling. The three young scientists are beside themselves with all there is to see and do and record. Warm this morning – 78 in the sun."

To all the usual sounds were sometimes added new exciting ones. One night after we were all in our tents we heard, far over toward the river, a short, sharp cry. "A fox, I think," said Olaus, and then we heard Brina, out of her tent, with her glasses: "Oh, I see him; a cross fox, way beyond the lake, over toward the river, and there's an owl, diving at him – a short-eared owl I think!"

Little episodes like this made up our lives in Lobo, and we were all completely absorbed by them. The sights and sounds of our days and our daylight nights were not of our making or doing; we were simply the visiting observers of Spring in

the Arctic's natural world, trying to be as unobtrusive observers as possible.

Here it was easy to forget the man-world — to relax into this nature-world. It was a world that compelled our entire interest and concentration, all else forgotten. As we walked over the tundra our attention was completely held by the botanical achievement of that composition of moss, lichens, small plants and bright flowers, yet we were alerted to identify every bird, to note every evidence of bears — moss and roots dug up, tracks in the mud at the edge of pools. And since our way always led by either the river or some of the many lakes, we were identifying water birds, shorebirds, ducks, grebes. How could we be anything but absorbed?

We were a party of five. Each day after breakfast each one delved into the "snack box" and packed his own lunch — Jersey Cream biscuits, cheese, raisins, apricots, figs, chocolate — and with rucksack on back, camera and binoculars slung on, set off. Thus four or five different localities were explored on each trip. And the big news in our lives, related each evening as we returned to camp, went something like this:

"Three ptarmigan nests, one with seven eggs, two with six. Two tree sparrow nests. One yellow-legs nest. I saw three bands of caribou, and got close enough to photograph a cow and calf, and later, by that second little lake north of here, we stood behind a little spruce and a beautiful bull with a good set of antlers came right past us without knowing we were there and I got two pictures before he heard the camera."

Then I would break in.

"Olaus and I were eating lunch on the bank of the river and suddenly we saw a red-throated loon floating downstream. He went right past us, and the interesting thing was that as he swam along he constantly turned his head from one bank of the river to the other as though searching for something, and every few minutes gave that long lonesome one-toned cry."

Somebody else:

"I found a least sandpiper nest and the female stayed right around me, making little sounds, and getting back on the eggs right there within five feet of me, while I kept on taking pictures!"

Or someone would report:

"I got movies of a cross fox; maybe the same one we heard the other night. He still had a beautiful brush, and he trotted and galloped clear across the flat by the river right in front of me. I don't think these animals up here know about man — they don't seem to have fear."

Lobo itself, we found, was the richest in all animal activity. On the days when we stayed in camp to write up journals, put up specimens or do camp chores, the animal world still claimed our attention. The girdle of water next to shore widened each day, but for ten days after we landed the ice was still a highway for animals. Bob sat just below camp one afternoon watching the performance of three muskrats. Suddenly they all dived. He glanced around. A fine big gray wolf stood above him on the slope. There is no way of knowing who was most surprised, but Lobo did not run. He merely turned and trotted back, and down to the ice, and we all watched him going away unhurriedly to the far shore. And that is how our lake was named Lobo.

A few mornings later, as we sat on the mossy slope at camp eating our stewed fruit, the first course of breakfast, a caribou appeared from behind a far point and moved onto the ice. Then came another and another, until there were about fifty, walking toward us. A sudden crawling of people to reach cameras and glasses, then motionless stillness. On they came, right across in front of us, silhouetted against the ice, heels clicking on it, blue sky and the low brown hills behind them. In the absolute stillness of that sunny morning the whispering sound of those many hoofs on the honeycombed ice was a sound like no other, and long to be remembered. Serenely they moved along, and stepped up onto the tundra at the far end of the lake. We all drew a deep breath. Brina said: "How many people in the world get to see anything like this? What a memory to have!"

These were the sounds and the sights of Lobo, but the land was no less exciting. When we landed on the ice of the lake on June 1, the snow was gone from the land and the prevailing color was brown; there was no green vegetation except for the little spruce trees. But there was one flower blooming flat on the ground, a deep red-purple-rayed single blossom, lone but definite announcement of winter's end — *Saxifraga oppositifolia.*

Willow Ptarmigan were nesting in the tundra during the first week in June, when the expedition reached the Sheenjek country. This is a male. It was not frightened by the visitors.

Photograph by George Schaller

Multitudes of others were crowding it, and in only a week Lobo was a different place. The first week of June, in the Arctic, must be the most exciting one of the year. Dwarf birch, Labrador tea, heather, cranberry, all sorts of annuals and grasses and alpine blossoms came into bud, into leaf, into flower so fast we were bewildered. The botanists could hardly keep up with the show. On June 5 George made a trip to the north shoulder of Table Mountain, which we called "The Ridge." He came striding home across the ice just at six o'clock, three and a half hours from the top, after a long day and many miles of hiking and climbing with nothing to eat but a pocketful of raisins. "What a country! Those clear mountain streams, and those slopes, full of flowers, and such valleys! And from on top, the mountains just go like this, up and down, up and down – you just want to keep going, up one ridge and down another!" Then he proceeded to unload a gorgeous assortment of alpine flowers that had to be taken care of before dinner.

Two days later Olaus announced that he wanted to go "over to the mountain" to the foot of The Ridge. So I went with him "to" the mountain – and on to the top, of course. Even a bit further, over the top, "to see what's on the other side."

Our way led around the base of our camp ridge, which extended back from the camp and back from the lake, north along the river, then out

ɔss a big belt of tundra pools and scattered ıce forest to a rather large lake half free of ice. it were twenty white-winged scoters, several ıter scaups and some pintails. Olaus sat down ı the glasses. I said: "Come look here — re's something that looks like a grebe, and I 't know." The usual routine of his looking, ng nothing, handing me the glasses, and I, itating, "Well — horned grebe?"

Yes, that's right. And I'm sure George and ıa haven't one listed yet."

o that was a highlight of that day, news to y back to Brina.

Ve left camp at nine; at ten we were enjoying lake and the ducks. At eleven we had hed and hopped and slogged across a great muskeg flat and were in the spruce again at foot of The Ridge. At twelve we were half up, still in spruce and some willow, but at edge of the great slate slide that marks this of the mountain. It was alpine-type mossy-ered rocks and mossy hammocks, with the roar stream in a draw nearby. We went over to it sat on soft hummocks in a fairyland of moss ıts, and ate our lunch, drinking ice-clear er from the stream.

Ve then began traversing, gaining altitude up r the treeless top third of the slope, among ow, purple and pine alpine flowers, with its "pipit-ing" and once the sudden "snore" of rock ptarmigan which flew off in front of us. s was Olaus's first climbing, but he didn't n to get as winded as I did. I think we both ced the helpful difference from our home alti-e in the Tetons of Wyoming, for here our e was only 2,500 feet. We were only slightly of breath — no heart pumping. The actual riness of long-unused climbing muscles was main reason for stopping. And it was this scle-weariness that crept upon us toward the of the long trek back at the end of the day. the day was worth the price.

)n top, across its carpet of mountain avens, ther, dwarf willow and dozens of other lovely ll plants, a balmy breeze blew. The sun was ı and blazing. I lay flat on the moss and ther, hat over face, and felt absolute content. s is not to be put into words. Here was I, ileged to lie on top of a mountain in the Arc- - an observer of the richness of this short summer pageant. Through half-closed eyes I looked across the valley to west and north. The mountains made an unearthly beautiful frieze against the blue — numberless, snowy, streaked with dark, various in shape, shoulders, domes and spires and castles, and cliffs and screes on their slopes reaching to the darkness of the forest belt. And then the broad valley, the winding Sheenjek, the countless lakes. I know nothing of painting, but I felt for a moment the urge a landscape painter must experience — the feel of brushing great strokes of brown, and fawn, and purple-gray and silver upon canvas. Gaze at such a scene, through half-closed eyes, from a mountain top; it strikes through to your inmost heart. Here is experience well rounded to a perfection. The place, the scene, the breeze, the bird song, the fragrance of myriad brave burgeoning mosses and flowers, all blend into one clear entity, one jewel. But how to describe this entity? It is the Arctic in its unbelievably accelerated summer life. It is also the personal well-being purchased by striving — by lifting and setting down your legs, over and over, through the muskeg, up the slopes, gaining the summit — man using himself. This wondrous mingling of weariness and triumph and sudden harmony with the exquisite airs, the burgeoning life of the bird and plant world of the tops, is part of the "glad tidings," surely, which John Muir meant.

This was June 7, end of our first week at Lobo. From the river, from the lakes, from the valley floor, to the top of a mountain, we had observed the richness of life in myriad forms, and yet we knew it was only the beginning. We hear always of the great abundance of life in the tropical regions, and it is true. And yet, here in the Arctic, our overpowering impression from this first week in the Sheenjek country was of abundance of Life.

Lying in the little tent that night, bandana tied over my eyes to keep out the light, I listened to the sounds of Lobo. The ptarmigan, robust and comical, "Come here, come here, come here," — "Go back, go back, go back;" the tree sparrow, cascade of sweet notes; the white-crown, plaintive, questioning, but strong. Always these three voices, and always from the lake the ducks, the loons, the gulls. This was their world. We, the fortunate visitors.

The Aquarium's First Collecting Trip

By THEODORE KAZIMIROFF
Fellow of the New York Zoological Society

LONG BEFORE Stage One of the new Aquarium is officially opened at Coney Island this spring, "first time" occasions will have lost their novelty. There will be the very first time the giant pumps start throbbing and pure sea water flows through all the hardrubber veins and arteries, the first time the entire filtering system is put into operation, no doubt the first little emergency when some new tankman forgets to turn a valve and a reservoir overflows . . .

But now the sense of novelty is still strong and I am glad I shared in one of the really historic occasions: the making of the first fish collection down among the Florida coral reefs.

It was, in fact, a historic occasion in more than one way. The first collection of living fishes for the new institution, certainly, but more importantly it established a fact. It proved by the severest test possible that the Aquarium is not season-bound and weather-restricted. For consider what happened:

Between December 30 and January 9, a hastily assembled crew of three men (only one of whom was experienced in collecting) drove a truck to Key West, made a brilliant collection in those all-but-tropic warm waters, and delivered the collection at the doors of the Aquarium with the loss of but four fish out of hundreds of specimens. And New York in early January was *not* enjoying tropical or even sub-tropical weather. On the contrary.

The entire trip covered some 3,400 miles, about half of it in the cold, snowy, icy latitudes. It proved conclusively, as far as Director Coates is concerned, that the Aquarium can now collect fish at any time of the year, anywhere that the truck can operate.

Before the old Aquarium closed at the Battery some sixteen years ago, its battered but seaworthy well-boat, the *Seahorse,* used to ply local waters in spring, summer and early fall. Florida shipments were a summer proposition, for winter collecting and shipment by freighter was considered risky and never practiced. But a good many months ago Mr. Coates began thinking about new ways to do old things. America moves almost anything by truck nowadays; why not fish?

He ordered a specially designed fourteen-ton

Brilliant Key West fishes such as these were captured during the Aquarium's first collecting trip. The collectors brought back grunts, snappers, groupers, angel fishes and others.

truck and fitted it with two 350-gallon tanks, a 200-gallon overflow tank, circulators, heaters, aerators, 110-volt generators, cab-to-truck intercommunication system, racks for nets, traps, boots, fishing gear — everything that a piscine Pullman could possibly need to travel anywhere anytime in complete independence of fixed installations. Nobody quite had the courage to refer to it as Coates's Folly, but comments *were* made that if the Director ordered anything more installed, it would have to be greased before it would slip into place.

The collecting crew told me Mr. Coates stood on the Aquarium's front door on December 30, waved cheerily as the collecting truck rolled away, and shouted: "You won't have any trouble."

They didn't. It worked.

* * *

I GOT TO TAKE PART in this gratifyingly successful undertaking because I know Key West so well from having spent many winter vacations down there at the southernmost tip of the continental United States. I had arranged to be in Key West two weeks before the truck arrived, and Mr. Coates suggested I might like to establish a few contacts among the fishing people, line up a well-boat and generally make myself useful as an advance man.

Years ago there were plenty of well-boats in Key West, but not any more. Victor Lang, director of the Key West Aquarium, helped me comb the wharves and coves for well-boats and the combing turned up just exactly one suitable craft. However, we couldn't have used more than one, even if there had been a dozen, so that was all right. Its owner volunteered to dry-dock it immediately, scrape the bottom, overhaul the engine and assign an experienced sponge-fisherman as her skipper. What more could anybody want?

Maybe it was my native New Yorker skepticism, maybe long experience with Key Westers. I shook hands with the well-boat owner to seal the agreement — but just the same, privately and without making any particular point of it, I hunted up an old friend, Capt. Tommy (Blackbeard) Lones and suggested that maybe the Aquarium crew would like to go out on his fine big charter fishing boat and pick up what they could. That was fine with Blackbeard. Any time — they'd be welcome.

The Aquarium crew rolled into Key West on New Year's Eve. New Year's Day I re-confirmed everything with the owner of the well-boat and went away feeling ashamed of myself for my double-dealing approach to Blackbeard Lones.

"Sure 'nough, everything's all set. Skip'll have her at the Municipal Pier at 10 o'clock tomorrow mornin'. You fellows be ready, now — don't you keep him waitin'."

Who keep who waiting? Around noon the next day I finally caught up with the skipper of our promised well-boat. He had been celebrating the New Year for 36 hours already, and the end was nowhere near in sight.

* * *

AGE OLSEN, Joe Armstrong and George Fay, the Aquarium crew, had plenty of small chores to do while I tracked the beer-can spoor

of the well-boat's skipper, but it is hard for the younger generation to be patient. My son Ted had to do *something* while he was waiting for the well-boat or its substitute to show up, so he pulled a face mask over his sunburned forehead and slipped over the side of the Municipal Pier for a few minutes' skin-diving. And thereby he discovered that we were sitting on top of the most wonderful and beautiful school of angel fish in Key West – all within a hundred feet of the Key West Aquarium, right under the pier. Not only angel fish, but grunts, jacks, barracuda, boxfish, squid, morays, spiny lobsters, spider crabs, hermit crabs, brittle stars, giant anemones and – well, just about everything Key West waters contain.

That was too good an opportunity to miss, so part of the crew assembled a keep-alive box that had been built in New York, and lowered it into the water under the pier, hoping to catch something overnight – if Ted would come up and let the fish settle. He finally did come popping to the surface with a shout that brought tourists flocking to the pier's edge. It seemed to be "Mshlursoray oorsl!" and after he took the breathing tube out of his mouth it became more intelligible as "Moray Eel!" He had brought up the first specimen, a Spiny Boxfish scooped up in a hand net, and with a little encouragement and more warnings to be careful he went down again and picked the moray out of a chunk of coral. Beau Gregories, spiny lobsters, spider crabs, starfish and an enormous hermit crab complete with its Triton conchshell home came up soon afterward.

When that sport began to pall, the crew borrowed the Key West Aquarium's 14-foot skiff and putt-putted off to a nearby key to look for Nurse Sharks. I returned from my skipper-quest just in time to see the skiff return, half awash with its overload of passengers and four 4-foot, harmless but pretty sharks.

The bulk of the Aquarium's first collection was formed in the next two days. Overnight the keep-alive box under the pier trapped a handsome array of Blue Angels, Black Angels, French Angels, grunts and parrot fishes. And ever-reliable Blackbeard Lones extended the welcome he had promised aboard his charter boat. With the overflow tank from the Aquarium collecting truck as a makeshift fish-well, the Aquarium crew sailed out with Capt. Lones and came back with all the Hog Snappers, Silver Snappers, grunts, morays, Margates, Mutton Fish, Yellowtails, Blue Runners, Red Groupers, Rock Hinds and Nassau Groupers we could possibly want. Even a rather rare little Ribbon Fish.

It was absurdly easy. The charter boat, the *Gulfstream,* was crowded with tourist fishermen who were only too glad to toss into the well anything rare or unusual or especially pretty that came up on their lines. The only trouble was that many of the fish were hauled up from considerable depths – 75 feet or more – and most of them were afflicted with a form of the "bends." That is, when put into the well at the low surface pressure, they promptly turned upside-down with distended bellies glistening in the sunshine. The old Key West trick for curing that trouble is "air bleeding" and the usual Key West instrument is the sharpened rib of an umbrella, for its triangular shape leaves a tiny flap of skin that acts as an air valve. Having no sharpened umbrella rib, I used the ship's icepick, gently inserting it just behind the pectoral fin and puncturing the air bladder to relieve the pressure. It worked perfectly and every single fish survived not only the sea part of the trip, but the long journey back to New York.

On the next and last day of fishing we chartered our own boat so as to work the reefs where the smaller fish lurked. In twenty feet of water so clear it seemed to be only a foot or so deep we anchored and Ted and I slipped over the side into an aquatic paradise. I have spent many hundreds of hours exploring underwater but not many of them in such an exquisite garden. From the surface the crew fished; I stayed below and soaked myself in color and form and movement and tried to capture some of it with an underwater motion picture camera.

Knowing better, knowing that there was no danger . . . nevertheless I summoned Ted and we came up and climbed into the boat when a dozen barracuda began circling, circling, circling . . .

But the spot to which I *must* return, and to which I hope the Aquarium will send a collecting party before the actual opening of the Stage One building in the spring, is a submarine gorge in the coral a few hundred yards from the place where we first went down to the reef. Fish come

and go, I know, but I think there will always be something we want there, and revisiting that brilliant, ever-moving, living chasm beneath the sea is an experience I would like to have again and again.

I would have explored it more closely this time but for one thing; it was already fully occupied. From every crevice in the coral jutted the head and the gently opening and closing mouth of a Giant Grouper. And at a little distance, swimming lazily and watchfully around and around, there was a school of sharks. Just waiting to see who would make the first move.

I did.

News from the Conservation Foundation

Cooperation with Herald Tribune Fresh Air Camps

Arrangements are now being worked out for joint participation with the Herald Tribune Fresh Air Fund in a three-year project to improve techniques in conservation education in summer camping. We should have more details regarding this program in the next issue of "Animal Kingdom."

Latin-American Interest

Spanish and Portuguese versions of our educational films are receiving ever-widening circulation below the border. And now a Spanish translation of our "Soil Erosion Survey of Latin America" has been published and distributed to government officials concerned with conservation policies and practice.

Natural and Social Sciences

Arrangements have been concluded between the Conservation Foundation and The Joint Council on Economic Education for sponsorship of companion volumes: "Teaching Science Through Conservation" and "Teaching Social Studies Through Conservation." The former, by Martha Munzer and Paul Brandwein, for which the Conservation Foundation is primarily responsible, has been completed in rough draft and should be ready for press by June 1957. The latter, for which The Joint Council is primarily responsible, should be ready for press about one year later.

College Teaching

"Conservation Education in the Colleges and Universities of the United States," by Charles E. Lively and Jack J. Preiss is now in the process of being printed by Ronald Press, and should appear in late Spring or early Summer.

School Teaching

The collection and analysis of curriculums as they relate to conservation from Kindergarten through Grade 12 in the public schools of the United States is being carried out by Elizabeth Hone. Work on this project is progressing rapidly. When completed — we hope by August 1 — we should know far more accurately than is now known what is being *attempted* nationwide in conservation education and resource-use teaching.

The second phase of this project, namely to discover *what is actually taking place in the classrooms,* will be initiated shortly after the preliminary phase has been completed.

Educational Television

Mr. John C. Gibbs, Chief of the Audio-Visual Department, has been appointed to the programming committee of the Metropolitan Educational Television Association.

Graduate Study and Placement

Roger Hale is actively engaged with representatives of industry and government in developing a program, stemming from the Ann Arbor Conference of last Spring, on graduate training in conservation. This program aims at bringing about a sharper realization of industry's need for personnel (working in area development, planning, watershed management, banking, etc.) who have had graduate training in conservation. The program also aims at encouraging universities

now offering graduate training in conservation to provide special courses for meeting the requirements of industry.

A permanent committee, presently consisting of the former chairmen of the sub-committees of the Ann Arbor Conference, has been established and is functioning toward these ends.

Discussion Guide

More than 3,000 copies of "Concepts of Conservation" have been distributed since its publication last summer.

Radio Program

The 13-week radio program which was broadcast over the NBC national network last spring and summer, being carried in whole or in part by 36 stations, is still active. Nine independent stations in cities not involved in the original broadcast, have carried or are now carrying some of these programs.

BEHIND THE SCENES

NEWS AND NOTES OF THE ZOOLOGICAL PARK, THE AQUARIUM AND THE DEPARTMENT OF TROPICAL RESEARCH

Osborn and Nigrelli Participate in AAAS Meeting in New York

President Osborn was one of the key speakers in a symposium on "Resource Development and Population Growth" organized at the meeting of the American Association for the Advancement of Science in New York during the last week in December. He spoke on "Our Reproductive Potential" at a meeting organized by the sections on "Industrial Science" and "Social and Economic Sciences." His talk, received with great interest at the meeting, was widely quoted in the press, and will be published in *Science*.

Dr. Nigrelli was organizing chairman of a symposium on "New Ideas on Spontaneous Generation" at the AAAS meetings.

"Old Bum," the Bowery Alligator, No Longer with Us

Some eight years ago a small Alligator was brought to the Reptile House by a most unlikely pet-owner—an elderly derelict of the type usually called a "Bowery bum." He explained that some months before he had rescued the reptile from a gang of boys who were stoning it in a Bowery street. Where it came from, he did not know; presumably it had been liberated by someone who had brought it back as a souvenir of a Florida trip, since that is the origin of most of the baby Alligators that are presented to the Zoo.

The derelict cherished the battered little Alligator, took it to his room, fed it on hamburger, and kept it warm during the winter by letting it sleep with him.

He explained that it was necessary for him to have an operation, and since he had no one to take care of his pet he was turning it over to the Zoo.

Some weeks later, obviously just out of hospital, he came back to the Zoo to see his pet. The operation had been a partial success but he would have to have another one shortly, he explained. Before returning to the hospital, he wanted to see his little Alligator. He promised to return again after the second operation, but he never did, although it is certain that he would have done so had he survived.

In the years since then, "Old Bum," as the Alligator was affectionately named, has become one of the favorites of the Reptile House. Unlike most Alligators, it was and remained quite tame and readily allowed itself to be picked up and handled. Under conditions of warmth and plenty of food, it grew rapidly and recently was measured at 7½ feet—too long to be readily picked up by its keepers, although it made no objection when they attempted to do so.

Now "Old Bum" has died, from gastro-enteritis. It is doubtful that we will ever again have such a docile Alligator. Certainly not one with such an unusual history.

Mechanization may be faster for big jobs of snow removal, but during a heavy snowfall in January the Zoo's motor plow was busy elsewhere and Jenny, the Donkey, went to work.

Dr. Beebe Reports on a Quest for Butterfly Eggs

Following his custom when the Department of Tropical Research is on one of its expeditions, Dr. William Beebe has sent a report of the activities of the Department from December 12 when Dr. Beebe, Miss Jocelyn Crane and Miss Barbara Young, the latter a new addition to the staff, sailed from New York on the Alcoa Line *Partner* for Trinidad, to early January.

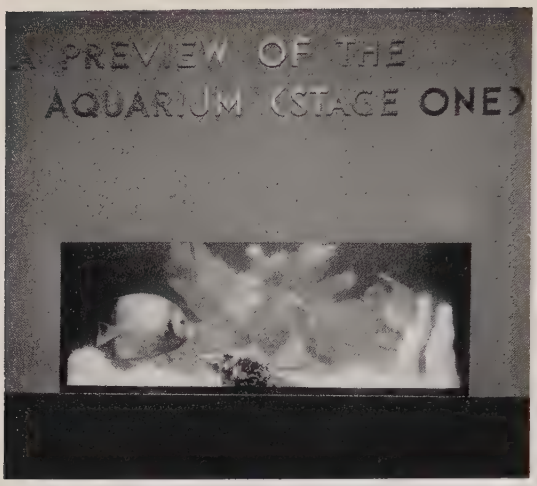
Stops en route are usually devoted to collecting or observing whatever the Department is working on. When the *Partner* steamed up the Surinam, Commewijne and Cottica Rivers in Dutch Guiana, Dr. Beebe wrote:

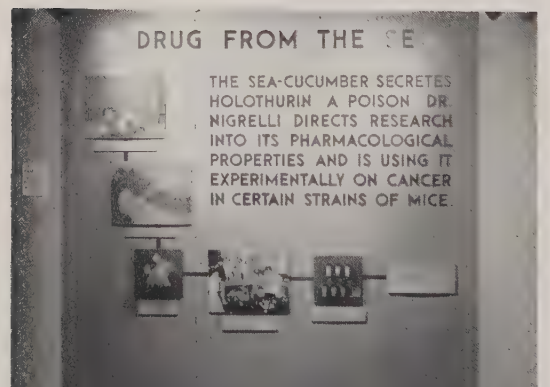
"At Moengo, we had four hours of remaining daylight. The manager of the bauxite mines met us and drove us furiously through rain, mud and mud to Casa Blanca. This was where we spent a month, three years ago, as guests of Director and Mrs. Meijer. In the garden we found a large tangle of passion vines, planted, as promised, by our kind and thoughtful hostess, but examination of these and those climbing over our insectary revealed not a single egg.

"From here on, we had remaining two hundred and forty minutes of daylight to find and collect eggs of the heliconid butterflies we were studying, eggs which were one-seventeenth of an inch in height and laid only on the dark-green leaves of a particular species of passion vine. We covered twenty-five miles of road, leaping out of the car at any sight of a favorable place. We failed!

"Muddy, wet and discouraged, we returned to the *Partner* to find thousands of Gray-breasted Martins swinging about in dense flocks and alighting on the guy wires of the bauxite factory.

"On board, just before dinner, Jocelyn disappeared and was later located by loud, incoherent screams, whether of pain or joy we could not tell. Finally, she was located in the heart of a brushy tangle growing out of muddy bauxite. The outcry proved to be of joy, for she had found three eggs and five just-hatched caterpillars before the last night of 1956, New Year's Eve, closed down. The god of happy scientists was with us and all eight caterpillars were thriving and eating heartily when we arrived at Simla three days later."




DRUG FROM THE SE
THE SEA-CUCUMBER SECRETES HOLOTHURIN A POISON DR. NIGRELLI DIRECTS RESEARCH INTO ITS PHARMACOLOGICAL PROPERTIES AND IS USING IT EXPERIMENTALLY ON CANCER IN CERTAIN STRAINS OF MICE.

ANNUAL MEETING SCENES

The Zoological Society's annual Members Meeting returned to the Waldorf-Astoria on January 18 and thus again had an opportunity to show, in panels and other types of exhibits, some of the things we have been doing the past year and some of the newest and most attractive animals. The Ballroom was filled to overflowing for the program of motion pictures and addresses by President Osborn and Park Commissioner Robert Moses

Long-wattled Umbrella Bird Is on Display Again

When Charles and Emy Cordier, at that time the official animal collectors for the New York Zoological Society, returned from Ecuador in 1950 one of their treasures was the Long-wattled Umbrella Bird that had never before been exhibited. We promptly placed the bird on exhibition, and almost as promptly it demonstrated that it did not like the proximity of other birds and people – so much so that after a few weeks it had to be retired to the so-called Quarantine Room in the Bird House where it could have almost complete seclusion.

Long-wattled Umbrella Bird

In an attempt to satisfy the requirements of oth bird and visitors, Mr. Conway has installed eavy, broad-leaved planting in one of the comartments in the main hall of the Bird House, nd the Long-wattled Umbrella Bird is again on display. After a week in public view it seems to have accepted this invasion of its privacy with good grace and we are hoping that the thick planting will enable it to be kept on exhibition.

Aquarium Staff Moving to Coney Island

After being "guests" of the Zoological Park since the fall of 1941 when the old Aquarium at the Battery was dismantled, the staff of the New York Aquarium started moving to the new Stage One Aquarium building overlooking the sea at Coney Island during the last week in January. The operation of moving offices, laboratory equipment and many of the fishes to the new home will be completed during February.

IN BRIEF

More Fish from Mexico. The arrival by air of seven boxes of live fish (in plastic bags partly filled with water) was the first indication at the end of the January of the success of Dr. Myron Gordon's recent collecting trip in the state of San Luis Potosi in Mexico. Subsequently, letters reported that Dr. Gordon and his associates, Donn Rosen and Malcolm Gordon, had collected five species or subspecies of swordtails and one platyfish, and were hoping for success in their efforts to collect another subspecies of platyfish. The fish will be used in studies in the Aquarium's Genetics Laboratory.

President. Dr. Ross F. Nigrelli, the Aquarium's Pathologist, assumed office as President of the New York Academy of Sciences on January 1, to serve through 1957.

Muyoni Is Improving. Muyoni, our new female Okapi, was heavily infested with parasites and was in poor general condition when she arrived at the Zoological Park on November 1, 1956. Under treatment constantly since that time, she is now showing definite improvement and it is likely that she can be quartered with Bilota, the male, this coming spring.

Mid-winter Babies. Five Dingo pups were born on December 23 and are now beginning to venture forth from their shelter outside the Kangaroo House. Since November 23 we have had occa-

sional glimpses of a young Agile Wallaby in its mother's pouch in the same building. And at the African Plains winter shelter, the keepers are watching with pride and satisfaction the well-being of four Nyalas born between January 4 and 10. In the last few years there has been a fairly high mortality among newborn Nyalas, but the present crop seems strong and healthy.

Longevity Record. A longevity record for the species apparently was established by an Anoa, or Pigmy Buffalo, which was born in the Zoo on July 16, 1928, and died on January 10, 1957. This was a period of 28 years, 5 months and 25 days. The best other record known to us is of an Anoa in the St. Louis Zoo which lived just under 24 years.

PUBLICATIONS OF INTEREST

FAUNE ET CHASSE EN AFRIQUE OCCIDENTALE FRANÇAISE. By Georges Roure. Many photographs, maps, and black-and-white illustrations by Lucien Blancou. 412 pp. Edition G.I.A., Dakar; Distribution: Librairie René Thomas, 36, Rue Geoffroy-Saint-Hilaire, Paris (Ve), France. 1956. [No price stated].

This is a rather specialized publication, noted here because it deals thoroughly and competently with a part of the world about which there is nothing comparable in print, except a 1952 edition of the same work. The subtitle is "Guide du Tourisme de la Nature Vivante," and it is exactly that – a guide to the wild animals of French West Africa, with lists of mammals and birds, scientific and popular names, copious illustrations, ecological discussions, suggestions for photographing and hunting, itineraries by which animals can be visited, abstracts of conservation laws and a bibliography. The text is, of course, in French. It is not a scientific reference work but as a popular guide to the fauna of the country it is excellent. – W. Br.

New Members of the New York Zoological Society

(Between November 1 and December 31, 1956)

Patron

Miss F. E. Quinlan

Life

Mrs. Marshall Field

Contributing

Cass Canfield
Miss Linda Darnell
Harry Eldridge
Mrs. John Elliott, Jr.
Miss Frances Ferguson
Fred J. Freese
Mrs. David Grace
Dr. Samuel F. Groopman
Melville B. Grosvenor
Mrs. Roger D. Hale
Daniel Kingsford
Charles Kiuttu
Paul W. Knaplund
Myron Mayer
Allan J. McIntosh
Roy R. Neuberger
Dr. William J. O'Connell
Ben Park
Mrs. Charles R. Peck
Henry L. Pierson
Orville Prescott
H. W. Schimmelpfeng
Robert C. Stover
Mrs. M. Brown Trimble
Hunt T. Wagstaff
Mrs. Thomas J. Watson
Norman Weiden

Annual

Mrs. Beverly W. Abrams
Siegmund Adler
Dr. Evelyn Apogi
Robert O. Babcock
Mrs. Dana C. Backus
Lt. Joseph P. Belmont
Paul Blum
Dr. Thomas Lee Bucky
Mrs. Fulton Cahners
Mrs. S. Park Cleveland
Miss Barbara Colbron
Miss Florence Davey
Miss Diana M. Dennison
Mrs. Herbert Dimondstein
Dr. A. Philip Dinin
John G. Edwards
Dr. Nathan Eisen
Dr. William J. Eisenmenger
Dr. Max Ellenberg
Martin Forscher
Mrs. Jo Ann Forster
Mrs. Helmut N. Friedlaender
Dr. Alexander J. Friedman
Dr. Norman Goldfarb
Richard E. Green
Miss Lois M. Grier
Paul Grillo
Louis Joel Halpryn
Miss Marie L. G. Halsted
Dr. Emeline Place Hayward
Mrs. John H. Healy
Mrs. Sidney Hechinger
Carl Holmes
Thomas Howley
Robert Hurwitt
Mrs. E. Powis Jones
Dr. Theodore Kamholtz
Miss Helen Ann Leavenworth
Dr. Arthur Lind
Mrs. Ronald Macdonald, Jr.
Master Jeffy Magnes
George A. Mallett
Dr. James A. L. Mathers
Dr. Valentino D. B. Mazzia
Harry A. Moody, Jr.
Dr. Leon Moses
Worrall F. Mountain, Jr.
Dr. R. S. Mumford
Dr. C. Paul O'Connell
Mrs. William A. Paddock
Dr. Frank H. Peters
Mrs. V. Petrucelly
Vito A. Poveromo
Dr. Alex Rabinowitz
Dr. Vincent E. Ragaini
Dr. Robert M. Robbins
Master Don Hall Rosebury
Dr. Philip Rosenblatt
John David Russell
Dr. Julius Schneiderman
Jules Segal
Dr. Henry Siegel
Benjamin Silver
Nate Sock
Thorwald Ternstrom
Dr. John J. Vasile
Dr. Louis J. Vorhaus, 2nd
Robert Vranek
Dr. John L. Walker
Miss Annie R. de Wasserman
Dr. Robert J. Weisenseel
John Barry Zischang

It won't always be winter

UNLIKE Woodchucks, Pipistrelles, Western Ground Squirrels and Jumping Mice, the Zoo doesn't hibernate all winter. Awake and above ground, its temperature is normal—far above the winter torpor temperature of the Little Brown Bat, for example.

Of course, we don't see too many visitors these chilly days *—and that's one of the reasons we were glad to see some 2,000 members and friends at the Waldorf for our annual meeting January 18. The enthusiasm that evening foretells (we hope) many visits to the Zoo this coming year by members, and their friends who (we hope) may soon become members. (And they will, if you ask them or send us their names and addresses so we can send information about Society membership.)

Plan one or two Zoo visits for the months ahead. Membership privileges are designed to make your visits more enjoyable, so we urge you to use them. And don't forget to tell your friends about them.

MEMBERSHIP COMMITTEE
The Zoological Park
New York 60, N. Y.

* Even on the coldest, most miserable day, some visitors always come to the Zoo. As far as anyone on the Staff can remember, the record low for visitors was 7, years ago. And what a terrible day that must have been!

NEW YORK ZOOLOGICAL SOCIETY
FOUNDED 1895